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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,661	03/23/2001	Shunpei Yamazaki	SEL 247	6015
7590 06/28/2004				
COOK, ALEX, McFARRON, MANZO, CUMMINGS & MEHLER, LTD. SUITE 2850 200 WEST ADAMS STREET CHICAGO, IL 60606		EXAMINER MULPURI, SAVITRI		
		ART UNIT 2812		PAPER NUMBER
DATE MAILED: 06/28/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,661

Applicant(s)

YAMAZAKI ET AL.

Examiner

Savitri Mulpuri

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/6/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The information disclosure statement (IDS) submitted on 4/ 6/2004 was filed after the mailing date of the non-final action on 12/30/2004. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in combination with Kim et al and Fujitsu Ltd (JP-01274385 A).

Admitted prior art teaches a method of manufacturing light emitting diode; forming an anode on insulator layer, electroluminescent layer, forming cathode electroluminescent layer. Prior art does not teach plasma treatment before forming metal or cathode layer. Admitted prior art also teach doping cesium or Cs into electroluminescent layer to form electron transportation layer or electron injection layer in an effort to reduce number of deposition layers in the electroluminescent OLEDs. Admitted prior art discloses OLED is used as EL display device. Admitted prior art clearly mention doping cesium into electroluminescent layer results transportation layer without separate deposition of transpiration layer but not plasma (see titled under "description of Related Art).

Kim et al discloses sequentially depositing organic layer" 155 "; performing plasma treatment on the organic layer in argon or hydrogen plasma and then depositing metal layer "140". Kim et al teaches a method of making semiconductor device such as

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thin film transistor by performing plasma treatment on the organic layer, which provides good adhesion between organic layer and subsequently formed meat layer. (see fig 2 A-2 B and 4 A-4 B and related description). It would have been obvious to one of ordinary skill in the art to perform plasma treatment on organic layer in the invention of Admitted prior art before forming cathode for the benefit of good adhesion.

Since Kim teaches plasma technique, the modified invention of admitted prior art would create hole or electron injection or electron or hole transporting layer or blocking layer depending in substrate /anode/EL layer/ cathode or substrate/cathode/el layer/anode structure. Similarly as Cs ions doped in the admitted prior art would have electron injection layer in organic layer, and same elements also lowering LOMO level and increasing the HOMO of the EL layer. Both references are silent triple excitation claimed in claims 16, 22. Modified invention of Admitted prior art having doped organic film and emitting light through triple excitation. See for example, Baldo explains iridium doped organic film and emitting light through triple excitation and producing very high efficiency OLED based on electroluminescence.

Neither Neither Kim et al nor Admitted prior art mentioning particularly halogen elements into electroluminescent layer. Fijutsu reference teaches heat treatment of electroluminescent layer formed on insulator layer in fluorine plasma. It would have been obvious to one of ordinary skill in the art to perform electroluminescent layer in admitted prior art in halogen plasma as alternative to cesium doping to improve the efficiency of the electroluminescent device.

Response to Arguments

Applicant argues that Admitted prior art does not teach Cs ions. However, Admitted prior art clearly teaches doping Cs or low work function elements so that doped region can be used as carrier transportation layer without separately forming additional carrier transportation layer (see in page 1, para 0008). Because secondary reference Kim teaches argon or hydrogen plasma on electroluminescent layer for good adhesion with subsequently formed electrode layer. Modified invention of admitted prior art would inherently have transportation layer or injection layer or blocking layer by cesium plasma treatment on electroluminescent layer in addition to good adhesion as taught in Kim et al.

Broadly electroluminescent or narrow bandgap organic electroluminescent layer with two types of light emitting devices forming anode first followed by successive layer of EL layer, or one of carrier injection layer or carrier transportation layer or carrier blocking layer and cathode or light emitting diode in reverse order of forming cathode on a substrate followed by EL, one carrier injection layer or carrier transportation layer or carrier blocking layer, and anode and plasma treatment of EL layer with group 1 or 2 elements.

Applicant's arguments with respect to claims 1-42 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 703.305.5184. The examiner can normally be reached on Mon-Fri from 8 to 4.30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Savitri Mulpuri
Primary Examiner
Art Unit 2812